



Case Study



Property Owner

Consortium of investors
(Deutsche Finance and Yoo Capital)



Main Contractor

Laing O'Rourke



Architect

SPPARC & Adamson



Structural Engineer

Robert Bird Group



Acoustic Consultant

Buro Happold (Vanguardia) & SLR

Stravibase VHS

- Isolate building structures from vibration and noise generated by external or internal sources
- Designed to support very large loads whilst being significantly smaller in plan dimensions than traditional elastomer bearings

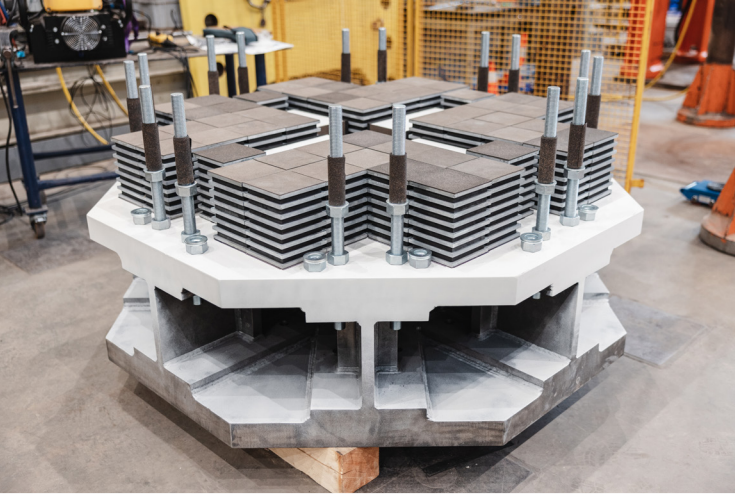
OVERVIEW

Olympia London, an iconic 43,728 square meters venue in the heart of London, has captivated visitors for almost 140 years with its diverse range of events and spectacular shows.

The ongoing redevelopment project encompasses the refurbishment of existing buildings as well as the construction of new structures. The central building will feature office space, a new exhibition area, and a façade retention.

One of the newly constructed buildings is called the Central building. The latter is a mixed use building which is constructed on top of the existing West hall. The Central building needed to be decoupled from the West Hall to minimize structure-borne noise transfer between the West Hall and the offices planned in Central. In this regards, our team designed three massive pre-compressed bearing assemblies to limit the deflection during the construction works.

Each of the bearing assemblies featured a custom designed steel housing with integrated failsafes. The Stravibase VHS solution has been selected for this design and to bolster the load capacity, additional frozen Stravibase VHS bearings were supplemented to the assemblies.



SOLUTION

Our engineering team meticulously designed the **three bearing assemblies comprised of Stravibase VHS** very high stress bearings, in turn consisting of successive layers of high resilience elastomeric pads and steel plates. **Each assembly weighed 12 tons** and was **pre-compressed to 75% of the dead load**, limiting deflections during the construction phase.

To ensure safety and reliability, **failsafes** were integrated into each structural bearing assembly. Furthermore, two of the bearing assemblies were **supplemented with frozen bearings** to enhance their load capacity.

Due to the substantial size and weight of the steel bearing assemblies, they had to be transported individually to site and lift cranes were required to facilitate their installation. In January 2022, our team in the UK collaborated closely with the contractor to oversee the installation process.

The dedicated engineering team, comprising engineers, drafters, and research and development professionals, displayed unwavering flexibility and continuous support throughout the two-year design phase. They adeptly adapted to changing demands and evolving loads, ensuring that the final designs not only met but exceeded client expectations and adhered to strict regulatory requirements.

Note: to respect fire requirements, a scaled version of the bearing assemblies has been designed and tested according to the EN1365 and performed way beyond 120 minutes required by the regulation.



AT A GLANCE

CHALLENGES

- Given the size and weight, each bearing assembly had to be delivered to site individually
- Cranes were needed to lift and install the bearing assemblies

BENEFITS

- Pre-compression to 75% of the dead load limiting deflections during construction
- Integrated failsafes preventing significant accidental deflections in case of major events (e.g. fire, explosion, subsidence, etc.)

7Hz

Natural
Frequency

188 pcs

Stravibase VHS
Bearings

32 pcs

Frozen
Bearings



Frozen Bearing Technology:
a replacement strategy by CDM Stravitec